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EXAMINER	
PATHAK, SUDHANSHU C	
ART UNIT	**PAPER NUMBER**
2634	8

DATE MAILED: 08/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	**Application No.**	**Applicant(s)**	
	09/729,694	YANG ET AL.	
	Examiner	**Art Unit**	
	Sudhanshu C. Pathak	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *May 26th, 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *27* is/are allowed.

6)☒ Claim(s) *1-26,28 and 29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *March 26th, 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-to-29 are pending in the application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-3, 5-6, 11-15 & 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freeburg (5,095,535) in view of Schulz (6,611,511).

Regarding to Claim 1, Freeburg discloses a smart antenna system for a RF communication system comprising a transmitting and receiving station (Abstract, lines 1-10, Fig. 1a, 2, 3 & Column 1, lines 53-68 & Column 2, lines 1-12) further comprising a plurality of sector antennas (Abstract, lines 1-5 & Fig. 1a & Fig. 2, element 250 & Fig. 3, element 330 & Column 4, lines 14-17, 24-27 & Column 5, lines 12-13); at least one transmitter, each configured to transmit a RF communication signal to be radiated from any one of the plurality of sector antennas (Column 1, lines 53-68 & Column 2, lines 1-12 & Fig. 3, elements 315, 330 & Column 3, lines 36-49 & Column 4, lines 64-68 & Claim 1, 16); at least one receiver configured to process signals received by the plurality of sector antennas, wherein the signals are received at any of the plurality of sector antenna while one or more of the plurality of sector antennas are radiating (Column 1, lines 53-68 & Column 2, lines 1-12 & Fig.

3, elements 310 & Column 3, lines 36-49 & Column 7, lines 7-22 & Claim 1, 16); a controller configured to determine one of a plural sector antennas to radiate the RF communication signal and cause the transmitter to transmit the signal via the one antenna while not transmitting via others of the plural sector antennas (Column 3, lines 36-49 & Fig. 3, elements 360, 365 & Column 5, lines 24-34, 54-68 & Column 6, lines 1-33, 67-68 & Column 7, lines 1-22, 30-43 & Fig. 4-5). However, Freeburg does not specify the implementation of the smart antenna system in a CDMA (spread spectrum system).

Schulz discloses a method and apparatus for controlling communication between a mobile cellular telephone and a cell of a cellular telephone network (basestation) (Abstract, lines 1-5 & Fig. 1 & Fig. 3). Schulz discloses the cellular telephone network comprising communication sectors and an antenna array at the basestation (Column 3, lines 30-67 & Column 4, lines 1-21 & Fig. 1 & Claims 1-3). Schulz further discloses implementing the smart antenna system in a CDMA (spread spectrum) system (Fig. 2, element 202 & Fig. 3, elements 202, 104 & Column 1, lines 34-67 & Column 2, lines 1-53 & column 5, lines 40-67 & Column 7, lines 10-23). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Schulz teaches implementing the sectorized smart antenna system in a CDMA cellular communication so as to improve the quality of the communication, and capacity of the communication system and also incorporate the benefits of a spread spectrum system such as increased tolerance to noisy environment and multipath interference, and this can be

implemented in the system as described in Freeburg with the spread spectrum communication protocol.

Regarding to Claim 2, Freeburg in view of Schulz discloses a smart antenna system for a spread-spectrum transmitting and receiving station as described above. Freeburg further discloses each of the plurality of sector antennas is oriented to radiate and receive signals within a substantially separate geographic region (Fig. 1a & Fig. 3, element 330 & Column 3, lines 5-11, 36-39 & Claims 1, 16 & Column 5, lines 12-13 & Column 7, lines 13-22, 34-43). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Freeburg in view of Schulz satisfies the limitation of the claim.

Regarding to Claim 3, Freeburg in view of Schulz discloses a smart antenna system for a spread-spectrum transmitting and receiving station as described above. Freeburg further discloses a controller configured to determine the one antenna to radiate based on an intended recipient of the particular spread-spectrum signals (Column 3, lines 36-49 & Fig. 3, elements 360, 365 & Column 5, lines 24-34, 54-68 & Column 6, lines 1-33, 67-68 & Column 7, lines 1-22, 30-43 & Fig. 4-5 & Claim 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Freeburg in view of Schulz satisfies the limitation of the claim.

Regarding to Claims 5 & 6, Freeburg in view of Schulz discloses a smart antenna system for a spread-spectrum transmitting and receiving station as described above. Freeburg further discloses the smart antenna system

comprising a plurality of serving sectors wherein each serving sector is associated with a respective one or more of the plurality of sector antennas and any one of the plurality of antennas is associated with only one of the plurality of serving sectors (Fig. 1a, 3 & Column 3, lines 5-11 & Column 5, lines 37-48 & Column 6, lines 1-15 & Column 7, lines 7-22, 34-43). Furthermore, Freeburg also discloses the number of serving sectors is less than or equal to the number of antennas (Fig. 1a, 3 & Column 3, lines 5-11 & Column 5, lines 37-48 & Column 6, lines 1-15 & Column 7, lines 7-22, 34-43). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Freeburg in view of Schulz satisfies the limitation of the claim.

Regarding to Claims 11 & 12, Freeburg in view of Schulz discloses a smart antenna system for a spread-spectrum transmitting and receiving station as described above. Freeburg further discloses the antenna system wherein each of the serving sectors covers a substantially contiguous geographical area and each of the serving sectors has at least two adjacent sector antennas associated therewith (Fig. 1a & Fig. 2, elements 250 & Fig. 3, elements 330). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Freeburg in view of Schulz satisfies the limitation of the claim.

Regarding to Claim 13, Freeburg discloses a method for controlling plural sector antennas of an antenna system for a cell transmitting and receiving station (Abstract, lines 1-10) comprising coupling each sector antenna of the

plural sector antennas to receiving circuits (Fig. 3, elements 310, 380, 375, 370 & Column 4, lines 64-68 & Column 5, lines 1-3); determine one of the plural antennas to radiate signals (Column 3, lines 36-49 & Column 5, lines 24-34, 54-68 & Column 6, lines 1-33, 67-68 & Column 7, lines 1-22, 30-43 & Fig. 4-5); selectively transmitting a communication signal via the one antenna while not transmitting via others of the plural antennas (Column 3, lines 36-49 & Column 5, lines 24-34, 54-68 & Column 6, lines 1-33, 67-68 & Column 7, lines 1-22, 30-43 & Fig. 4-5 & Claim 1, 16); and during the transmission, configuring each of the other sector antennas to receive a RF communication signals (Column 3, lines 5-11, 36-49 & Claim 11). However, Freeburg does not specify the implementation of the smart antenna system in a CDMA (spread spectrum system).

Schulz discloses a method and apparatus for controlling communication between a mobile cellular telephone and a cell of a cellular telephone network (basestation) (Abstract, lines 1-5 & Fig. 1 & Fig. 3). Schulz discloses the cellular telephone network comprising communication sectors and an antenna array at the basestation (Column 3, lines 30-67 & Column 4, lines 1-21 & Fig. 1 & Claims 1-3). Schulz further discloses implementing the smart antenna system in a CDMA (spread spectrum) system (Fig. 2, element 202 & Fig. 3, elements 202, 104 & Column 1, lines 34-67 & Column 2, lines 1-53 & column 5, lines 40-67 & Column 7, lines 10-23). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Schulz teaches implementing the sectorized smart antenna system in a

CDMA cellular communication so as to improve the quality of the communication, and capacity of the communication system and also incorporate the benefits of a spread spectrum system such as increased tolerance to noisy environment and multipath interference, and this can be implemented in the system as described in Freeburg with the spread spectrum communication protocol.

Regarding to Claim 14, Freeburg in view of Schulz discloses a smart antenna system for a spread-spectrum transmitting and receiving station as described above. Freeburg further discloses that the antennas that are coupled to the receiving circuits are configured to receive spread-spectrum signals in an associated serving sector (Column 1, lines 53-68 & Column 3, lines 5-11, 36-49 & Column 7, lines 3-22 & Claim 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Freeburg in view of Schulz satisfies the limitation of the claim.

Regarding to Claim 15, Freeburg in view of Schulz discloses a smart antenna system for a spread-spectrum transmitting and receiving station as described above. Freeburg further discloses determining one of the plural antennas is based on the received signals to be radiated from one of plural sector antennas (Abstract, lines 3-8 & Column 3, lines 34-49 & Claim 16). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Freeburg in view of Schulz satisfies the limitation of the claim.

Regarding to Claim 25, Freeburg discloses a computer readable medium (Fig. 3, elements 360, 365, 350 & Column 1, lines 51-52) bearing instructions for controlling plural sector antennas of a smart antenna system (Fig. 4-5 & Column 7, lines 44-68 & Column 8, lines 1-68) wherein said instructions being arranged to cause one or more processors upon execution to perform steps comprising coupling each sector antenna of the plural sector antennas to receiving circuits (Fig. 3, elements 310, 380, 375, 370 & Column 4, lines 64-68 & Column 5, lines 1-3); determine one of the plural antennas to radiate signals (Column 3, lines 36-49 & Column 5, lines 24-34, 54-68 & Column 6, lines 1-33, 67-68 & Column 7, lines 1-22, 30-43 & Fig. 4-5); selectively transmitting a cellular communication signal via the one antenna while not transmitting via others of the plural antennas (Column 3, lines 36-49 & Column 5, lines 24-34, 54-68 & Column 6, lines 1-33, 67-68 & Column 7, lines 1-22, 30-43 & Fig. 4-5 & Claim 1, 16); and during the transmission, configuring each of the other sector antennas to receive a RF communication signals (Column 3, lines 5-11, 36-49 & Claim 11). However, Freeburg does not specify the implementation of the smart antenna system in a CDMA (spread spectrum system).

Schulz discloses a method and apparatus for controlling communication between a mobile cellular telephone and a cell of a cellular telephone network (basestation) (Abstract, lines 1-5 & Fig. 1 & Fig. 3). Schulz discloses the cellular telephone network comprising communication sectors and an antenna array at the basestation (Column 3, lines 30-67 & Column 4, lines 1-21 & Fig.

1 & Claims 1-3). Schulz further discloses implementing the smart antenna system in a CDMA (spread spectrum) system (Fig. 2, element 202 & Fig. 3, elements 202, 104 & Column 1, lines 34-67 & Column 2, lines 1-53 & column 5, lines 40-67 & Column 7, lines 10-23). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Schulz teaches implementing the sectorized smart antenna system in a CDMA cellular communication so as to improve the quality of the communication, and capacity of the communication system and also incorporate the benefits of a spread spectrum system such as increased tolerance to noisy environment and multipath interference, and this can be implemented in the system as described in Freeburg with the spread spectrum communication protocol.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Freeburg (5,095,535) in view of Schulz (6,611,511) in further view of Craig et al. (4,317,229).

Regarding to Claim 4, Freeburg in view of Schulz discloses a smart antenna system for a spread-spectrum transmitting and receiving station as described above. Freeburg further discloses a switch coupled with the controller, configured to temporarily couple the one antenna to any of the at least one transmitter (Fig. 3, elements 325, 330). However, Freeburg does not specify a switch configured to selectively couple an antenna to at least one transmitter.

Craig discloses an antenna system for transmitting and receiving comprising a switch for selecting an antenna coupled to a controller to any of the at least one transmitter (Fig. 1-2 & Fig. 3, elements 60, 90 & Column 4, lines 38-56). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that the antenna switch as described in Craig can be implemented as a switch into the system as described in Freeburg to select the sectorized antennas for transmission of signals to the specified sector thereby, making the transmission terminal more power efficient.

5. Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freeburg (5,095,535) in view of Schulz (6,611,511) in further view of Webb et al. (4,485,486).

Regarding to Claims 7-10, Freeburg in view of Schulz discloses a smart antenna system for a spread-spectrum transmitting and receiving station as described above. Freeburg further discloses a controller configured to independently determine the one antenna to radiate for each of the serving sectors (Column 3, lines 36-49 & Fig. 3, elements 360, 365 & Column 5, lines 24-34, 54-68 & Column 6, lines 1-33, 67-68 & Column 7, lines 1-22, 30-43 & Fig. 4-5). However, Freeburg does not specify that the transmitter further comprising a plurality of transmitters equal to the number of antennas each associated to a sector and the receiver also comprising a plurality of receivers.

Webb discloses a method and apparatus for transmitting and receiving signals comprising a plurality of antennas serving a plurality of sectors and further comprising a plurality of transmitters and receivers associated with each antenna (Abstract, lines 14-27 & Fig. 1-2 & Column 4, lines 41-63 & Column 5, lines 45-68). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Webb teaches that each transmitter / receiver (transceiver) associated to a respective sector antennas and each transceiver configured to process only the signals associated with the respective antennas and furthermore these transceivers can be implemented into the antenna system as described in Freeburg to better detect the received signals. Furthermore, the controller as described in Freeburg determines the sector and the respective sector antenna for the signal to be transmitted and hence the transmitter associated to the antenna is utilized.

6. Claims 16-19, 26 & 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webb et al. (4,485,486) in view of Schulz.

Regarding to Claim 16 & 29, Webb discloses performing a hand-off of a mobile station in a cellular system that includes a smart antenna system of plural sector antennas (Abstract, lines 1-4, 19-27 & Fig. 1-2 & Column 1, lines 25-40 & Column 4, lines 48-62) comprising recording signal strengths received at one or more of the plural sector antennas from the mobile station (Abstract, lines 19-27 & Column 5, lines 9-13); calculating the rates of signal changes from the recorded signal strengths (Abstract, lines 19-27, Column 2,

lines 57-68 & Column 5, lines 9-20 & Fig. 3a, elements 402-418 & Column 8, lines 12-68); assessing the movement of the mobile station based on the calculated rates (Column 5, lines 9-44 & Fig. 3a-d & Column 2, lines 57-68); determining when the signal strength received at one antenna from the mobile station reach a pre-determined threshold and further performing hand-off of the mobile station when reaching of a predetermined threshold is so determined (Fig. 3a-d & Column 2, lines 57-68 & Column 5, lines 9-44 & Column 8, lines 12-68). However, Webb does not explicitly disclose selecting the hand-off based on the assessment of the movement of the mobile station.

Schulz discloses selecting hand-off by the mobile station by assessing the movement of the mobile station (Column 3, lines 30-50, 61-67 & Column 4, lines 1-21 & Fig. 1). Schulz further discloses implementing the system in a CDMA (spread spectrum) cellular system (Fig. 3 & Column 7, lines 10-23 & Column 1, lines 35-67 & Column 2, lines 1-25). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Schultz teaches selecting hand-off based on the assessment of the movement of the mobile station and this can be implemented as a criterion for hand-off in any cellular communication system. Furthermore, hand-off is inherently based on the assessment of the movement of the mobile station in any cellular communication system, as the mobile station moves from a different sector or to a different cell and the assessment is based on measuring various system parameters.

Regarding to Claim 17, Webb in view of Schulz discloses a method for performing hand-off of a mobile station in a cellular system wherein selecting handoff is based on the assessment of the movement of the mobile station as described above. Webb further discloses hand-off comprising a hand-off between two different sector antennas serving two different sectors and a hand-off between two different two adjacent cells (Abstract, lines 19-27 & Column 5, lines 9-23).

Regarding to Claim 18, Webb discloses a method for performing hand-off of a mobile station in a cellular system wherein selecting handoff is based on the assessment of the movement of the mobile station as described above. Webb further discloses assessing the movement includes determining if the rate of change is indicative of tangential motion across an antenna sector or is indicative of radial motion within an antenna sector (Abstract, lines 19-27 & Column 5, lines 9-23).

Regarding to Claim 19, Webb discloses a method for performing hand-off of a mobile station in a cellular system wherein selecting handoff is based on the assessment of the movement of the mobile station as described above. Webb further discloses a step of determining when the signal strength reaches a predetermined threshold comprising determining when signal strength received at an antenna from the mobile station reach a first predetermined threshold (Fig. 3d, elements 474 & Column 5, lines 9-44 & Column 12, lines 50-65 & Column 13, lines 3-14).

Regarding to Claim 26, Freeburg discloses a computer readable medium (Fig. 2, elements 358, 362-366, 352-356 & Column 5, lines 45-68 & Column 6, lines 3-19) bearing instructions for controlling plural sector antennas of a smart antenna system (Fig. 3a-d & Fig. 4 & Column 8, lines 12-49) wherein said instructions being arranged to cause one or more processors upon execution to perform steps comprising recording signal strengths received at one or more of the plural sector antennas from the mobile station (Abstract, lines 19-27 & Column 5, lines 9-13); calculating the rates of signal changes from the recorded signal strengths (Abstract, lines 19-27, Column 2, lines 57-68 & Column 5, lines 9-20 & Fig. 3a, elements 402-418 & Column 8, lines 12-68); assessing the movement of the mobile station based on the calculated rates (Column 5, lines 9-44 & Fig. 3a-d & Column 2, lines 57-68); determining when the signal strength received at one antenna from the mobile station reach a pre-determined threshold and further performing hand-off of the mobile station when reaching of a predetermined threshold is so determined (Fig. 3a-d & Column 2, lines 57-68 & Column 5, lines 9-44 & Column 8, lines 12-68). However, Webb does not explicitly disclose selecting the hand-off based on the assessment of the movement of the mobile station.

Schulz discloses selecting hand-off by the mobile station by assessing the movement of the mobile station (Column 3, lines 30-50, 61-67 & Column 4, lines 1-21 & Fig. 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Schultz teaches selecting hand-off based on the assessment of the movement of the mobile station and this

can be implemented as a criterion for hand-off in any cellular communication system. Furthermore, hand-off is inherently based on the assessment of the movement of the mobile station in any cellular communication system, as the mobile station moves from a different sector or to a different cell and the assessment is based on measuring various system parameters.

7. Claims 20-24 & 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schulz (6,611,511) in view of Ariyavisitakul et al. (5,794,153).

Regarding to Claim 20, Schulz discloses a method and apparatus for controlling communication between a mobile cellular telephone and a cell of a cellular telephone network (basestation) (Abstract, lines 1-5 & Fig. 1 & Fig. 3). Schulz discloses the cellular telephone network comprising communication sectors and an antenna array at the basestation (Column 3, lines 30-67 & Column 4, lines 1-21 & Fig. 1 & Claims 1-3). Schulz further discloses implementing the smart antenna system in a CDMA (spread spectrum) system (Fig. 2, element 202 & Fig. 3, elements 202, 104 & Column 1, lines 34-67 & Column 2, lines 1-53 & column 5, lines 40-67 & Column 7, lines 10-23). Schulz discloses the sectors to be different regions extending out radially out from the same base station of one geographic cell site (Fig. 1).

Ariyavisitakul discloses a method for arranging plural sector antennas into plural serving sectors of a cell base station comprising associating with each serving sector a respective first subset of the plural sector antennas (Fig. 1 & Abstract, lines 1-11 & Column 1, lines 23-36, 67-68 & Column 2, lines 1-30);

measuring the traffic load in each serving sector (Column 2, lines 1-30 & Column 3, lines 15-30 & Fig. 1 & Fig. 3-4); analyzing the measured traffic load to determine if a redistribution of the arrangement of the sector antennas is necessary (Fig. 1 & Column 1, lines 55-62 & Column 3, lines 15-67 & Column 4, lines 35-67 & Column 6, lines 39-52 & Claim 3); if redistribution is performed calculating a balanced arrangement of antennas within the serving sectors (Abstract, lines 1-11 & Fig. 1-2 & Column 6, lines 39-59 & Column 1, lines 55-62 & Column 3, lines 15-67 & Column 4, lines 35-67 & Column 6, lines 1-40); associating with each sector a respective second subset of plural antennas according to a balanced arrangement wherein at least one respective subset for an associated serving sector differs from the respective first subset serving sector (Fig. 1 & Abstract, lines 1-11 & Column 1, lines 23-36, 67-68 & Column 2, lines 1-30 & Column 6, lines 39-59 & Column 2, lines 16-26). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Ariyavisitakul teaches a method for arranging plural sector antennas into plural serving sectors of a cell base station comprising associating with each serving sector a respective first subset of the plural sector antennas and this can be implemented in the system as described in Schulz so as to provide accurate estimates of the radio traffic in each sector and to dynamically adjust the load in each sector.

Regarding to Claims 21 & 23-24, Schulz in view of Ariyavisitakul discloses a method for arranging plural sector antennas into plural serving sectors of a cell base station as described above. Ariyavisitakul further discloses the first

arrangement associates the same number of antennas with each serving sector (Fig. 1-2 & Column 1, lines 23-27 & Column 3, lines 15-35 & Column 6, lines 39-53). Ariyavisitakul further discloses calculating a balanced arrangement to include calculating the traffic to be below a predetermined threshold (Column 3, lines 15-35 & Column 6, lines 1-9, 21-33). Ariyavisitakul also discloses calculating a balanced arrangement to include calculating an arrangement wherein the traffic loads between adjacent sectors is substantially equal (Fig. 1-2 & Column 3, lines 16-35 & Column 6, lines 21-52). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Schulz in view of Ariyavisitakul satisfies the limitations of the claim.

Regarding to Claim 22, Schulz in view of Ariyavisitakul discloses a method for arranging plural sector antennas into plural serving sectors of a cell base station as described above. Ariyavisitakul further discloses analyzing the measured traffic and determining if the traffic load in any one of the serving sectors exceeds a predetermined threshold (Fig. 1-2 & Column 6, lines 33-53 & Column 9, lines 6-17 & Column 3, lines 46-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Schulz in view of Ariyavisitakul satisfies the limitations of the claim.

Regarding to Claim 28, Schulz discloses a method and apparatus for controlling communication between a mobile cellular telephone and a cell of a cellular telephone network (basestation) (Abstract, lines 1-5 & Fig. 1 & Fig. 3). Schulz discloses the cellular telephone network comprising communication

sectors and an antenna array at the basestation (Column 3, lines 30-67 & Column 4, lines 1-21 & Fig. 1 & Claims 1-3). Schulz further discloses implementing the smart antenna system in a CDMA (spread spectrum) system (Fig. 2, element 202 & Fig. 3, elements 202, 104 & Column 1, lines 34-67 & Column 2, lines 1-53 & column 5, lines 40-67 & Column 7, lines 10-23). Schulz discloses the sectors to be different regions extending out radially out from the same base station of one geographic cell site (Fig. 1).

Ariyavisitakul discloses a computer readable medium (Fig. 2, elements 58, 52 & Column 6, lines 33-39) bearing instructions for arranging plural sector antennas of a smart antenna system (Fig. 1-4 & Abstract lines 1-11 & Column 2, lines 16-26 & Column 1, lines 55-63 & Column 3, lines 15-45) wherein said instructions being arranged to cause one or more processors upon execution to perform steps comprising of associating with each serving sector a respective first subset of the plural sector antennas (Fig. 1 & Abstract, lines 1-11 & Column 1, lines 23-36, 67-68 & Column 2, lines 1-30); measuring the traffic load in each serving sector (Column 2, lines 1-30 & Column 3, lines 15-30 & Fig. 1 & Fig. 3-4); analyzing the measured traffic load to determine if a redistribution of the arrangement of the sector antennas is necessary (Fig. 1 & Column 1, lines 55-62 & Column 3, lines 15-67 & Column 4, lines 35-67 & Column 6, lines 39-52 & Claim 3); if redistribution is performed calculating a balanced arrangement of antennas within the serving sectors (Abstract, lines 1-11 & Fig. 1-2 & Column 6, lines 39-59 & Column 1, lines 55-62 & Column 3, lines 15-67 & Column 4, lines 35-67 & Column 6, lines 1-40); associating with

each sector a respective second subset of plural antennas according to a balanced arrangement wherein at least one respective subset for an associated serving sector differs from the respective first subset serving sector (Fig. 1 & Abstract, lines 1-11 & Column 1, lines 23-36, 67-68 & Column 2, lines 1-30 & Column 6, lines 39-59 & Column 2, lines 16-26).

Allowable Subject Matter

8. Claim 27 is allowable over the prior art of record because the cited references do not contain the specified limitation of a cellular system consisting the cell-site coverage map and further predicting the mobile station's movement based on the received signal strength and then determining the location of the mobile station by comparing the received signal strength from at least one sector antenna against the cell cite coverage profile along with its predicted movement.

Response to Arguments

9. Applicant's arguments with respect to claims 1-to-29 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (703)-305-0341. The examiner can normally be reached on M-F: 9am-6pm.

- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (703)-305-4714.
- The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.
- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sudhanshu C. Pathak

STEPHEN CHIN
SUPERVISORY PATENT EXAMINE
TECHNOLOGY CENTER 2600